

All you need to know about

VITAMINS & EXERCISE

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VITAMINS AND FOOD

Current discussions and arguments in the press and on TV are providing the public with rather distorted and sometimes contradictory views on diet and such matters as heart disease, fats, additives and slimming.

In amongst this rather confusing information, the fact that we all need 12 vitamins, about 20 mineral salts, certain types of fat, adequate protein and energy is almost lost sight of.

So how does anyone know if their diet is adequate? Most of us manage, but whether we'd be better off with a different diet is hard to prove.

That's why dietary supplements are recommended, even if only as an insurance.

Even if you think you've got your diet right – it may not always be as full of vitamins as you think.

Storing, preparing or overcooking food can destroy vitamins essential for fitness and health.

When it comes to fresh foods too, the vitamin content is by no means certain. Raw freshly harvested and unprocessed fruits and vegetables vary in vitamin levels according to the plant variety, its method of cultivation and factors like the soil, the climate and the fertiliser used.

Vitamin C and the B vitamins, which are vital to the healthy growth of bone and tissue are the least stable vitamins. Even in raw vegetables the amount of vitamin C begins to fall as soon as it is harvested.

Further depletion of vitamins occurs as the food sits on the retailer's shelf and in the cupboard at home. Milk exposed to sunlight on the doorstep begins to lose vitamin B2.

Cooking destroys some more. About 50 per cent of vitamin C is lost in cooking. Vitamin B1, found in meat, vegetables such as peas, bread and cereals, is damaged by heat. So that there is some loss for example when making toast or cooking meat.

Even the way food is prepared on the chopping board can affect its vitamin content. The finer it is chopped, the more vitamin C will be lost. Keeping food hot will also reduce its vitamin content.

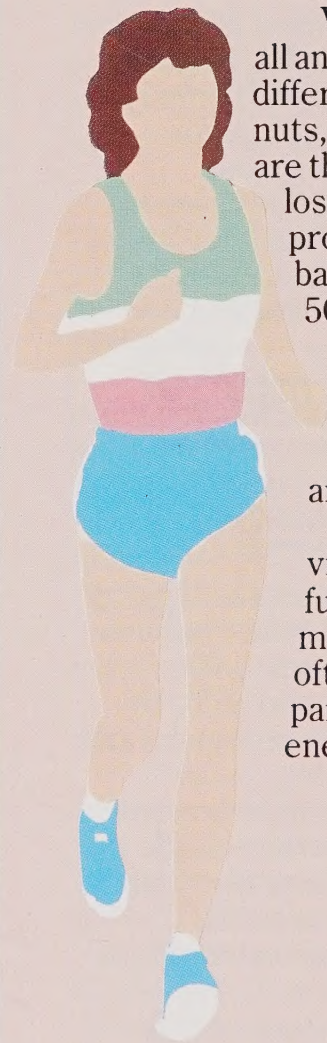
VITAMINS FOR ENERGY

THE B GROUP OF VITAMINS

One of the key groups of vitamins is the B group or B Complex – called the ‘energy vitamins’ because they help to release energy – B1 (thiamin), B2 (riboflavin), niacin (B3), pantothenic acid (B5), B6 (pyridoxine), B12 (cobalamin), folic acid (folacin) and biotin.

Because exercise requires more calories and therefore more B vitamins to release the energy, a B Complex supplement is useful for anyone engaged in sport and fitness training. Members of this complex work together helping to convert food into energy.

A study carried out in Germany showed that athletes who were given a B vitamin supplement for six days experienced less fatigue than previously during vigorous exercise in a warm environment with considerable sweating involved. There is a loss of vitamin B1 and pantothenic acid (B5) in sweat and hard work increases the loss of vitamin B2 in the urine.



Vitamin B1 (thiamin) is contained in all animal and plant foods, but with a wide difference of degree. Cereals, potatoes, nuts, beans and pulses, meat and liver are the best sources, but thiamin can be lost from food with refining and over-processing. Additives like alkaline baking powder can account for up to 50 per cent loss of the vitamin in food.

The symptoms of thiamin deficiency include getting tired easily, experiencing nausea, muscle weakness, digestive upsets and a tendency towards anorexia.

The other members of the B vitamin family all have similar functions. Deficiency causes muscle weakness, general fatigue and often skin complaints as well, while pantothenic acid is needed for energy metabolism.

VITAMINS

FOR PROTECTION

VITAMIN C

When we think of vitamin C we tend to associate it with eating a few more oranges to ward off winter colds. But there's far more to the vitamin than that.

For the sportsperson – and anyone who wants to stay fit – it's a natural way to improve wound healing and help the body recover from illness and damaged tissues.

The vitamin, also known as ascorbic acid, helps to form collagen in the body. This is essential for the growth and repair of body tissues, gums, blood vessels, bones and teeth.

The vitamin C also acts as an antioxidant and as such is thought to help the body to cope with allergies.

But perhaps one of the most important functions of vitamin C in relation to exercise is that it helps the body to absorb iron – a mineral which is needed for healthy blood but which may not easily be absorbed from food and which you can easily lose through perspiration.

The following case history neatly describes an example. A 1983 report from the Department of Sports Medicine in Holland revealed that measurements on members of a Dutch Olympic team showed 5%-6% of them with sub-normal levels of haemoglobin (iron-containing pigment of the red blood cells) and that two of them had such low levels that they were definitely anaemic. Another 5% had further indications of low body stores of iron.

Low body stores are taken as evidence that the enzymes in muscle, which need iron in order to function are subnormal. This naturally impairs athletic performance. A temporary fall in haemoglobin is in fact often found after strenuous exercise and is called "sports anaemia". This, it is suggested, may be due more to rapid destruction of the red blood cells during strenuous activity. This effect however is transient and does not explain low levels in trained athletes.

The authors of the report suggest that they were not likely to be due to an inadequate diet, but perhaps to poor absorption of iron.

When athletes need large intakes of energy they usually eat more fat. And fat tends to inhibit the absorption of iron.

A remedy is to take extra vitamin C to increase the amount of iron absorbed, for it has been well established that vitamin C helps in this respect.



Vitamin C is found in citrus fruits, tomatoes, green peppers and other green vegetables and new potatoes (some is found in the large older potatoes, but much less). Some vitamin C is lost in storage, as in the case of potatoes and other vegetables, and also during cooking. In fact, some frozen vegetables may in fact be higher in vitamin C than fresh ones picked some days earlier.

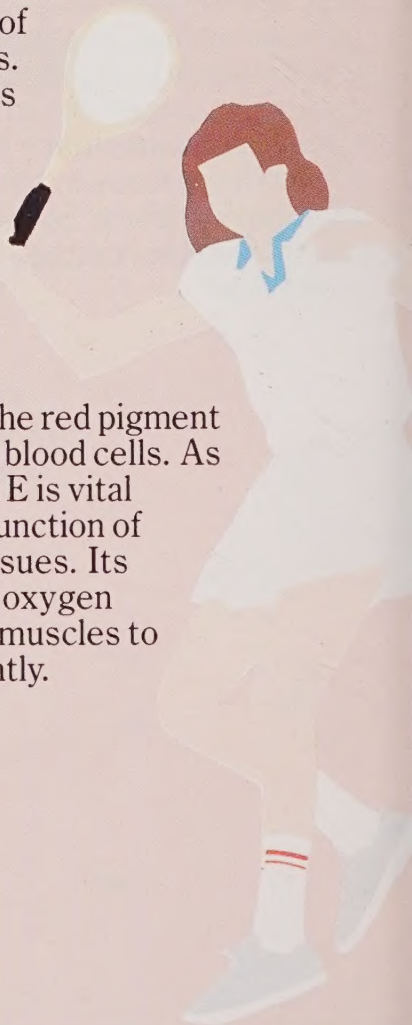
We can only store a limited amount of vitamin C in the body and we need at least 30 milligrams a day to stay healthy and 70mg to make sure of a high level of iron absorption. For the athletic type who needs extra vitamin C it's certainly not enough to have the occasional orange or citrus fruit drink and you would need to consume much larger amounts of vitamin C containing foods to get the maximum benefit for strenuous activity. So for optimum health you really should consider taking a vitamin C supplement every day.

VITAMINS FOR VITALITY

VITAMINE

Vitamin E has become known as the 'vitality vitamin', though its actual function in the body is still the subject of controversy in medical circles.

Athletes and other sports people need a very sophisticated form of oxygen supply. The body needs oxygen to convert glucose into energy. The only way that oxygen can be supplied to the working parts of the body is via the blood, where it is carried by the red pigment called haemoglobin in the red blood cells. As a natural antioxidant, vitamin E is vital to the formation and normal function of red blood cells and muscle tissues. Its effect on the body's supply of oxygen gives the right conditions for muscles to develop correctly and efficiently.



Muscles are so complicated that we are still trying to find out how they work. Muscles make up 40 per cent of your total weight, but without oxygen they cannot function.

One of the most important functions of vitamin E is to prevent the destruction of other essential nutrients like vitamins A and C or the sulphur containing amino acids.

Polyunsaturated fatty acids – essential for normal function of cells within the body – are another part of our diet which can be rapidly damaged without adequate vitamin E to protect them.

The diet of active health-conscious people often contains a higher proportion of polyunsaturated fats than average, because it has been shown that this can protect against heart disease.

So, if you prefer sunflower oil margarine to butter, remember to increase your intake of vitamin E accordingly.

VITAMINS FOR FITNESS

VITAMIN	FUNCTION	SOURCES	RECOMMENDED DAILY AMOUNTS (RDA)	PROBLEMS
A retinol	Essential for growth, night vision, maintenance of moist (mucus-secreting) tissues.	Milk, butter, margarine, green and yellow vegetables and fruits, especially carrots, liver, fish liver oils.	750mcg	Loss in frying, canning.
B1 thiamin	Essential for liberation of energy from foods.	Cereals (especially whole grain) meat, especially liver and kidney, potatoes, wheat germ yeast, nuts, beans.	1.2mg	Loss in cooking, in milling flour, toasting bread.
B2 riboflavin	Liberation of energy from foods.	Milk, liver, cheese, meat, beans, nuts, eggs.	1.6mg	Loss in cooking; loss from milk in sunlight.
B5 pantothenic acid	Metabolism of fats and carbohydrates.	Vegetables, liver, kidney, yeast, many foods.	Not known	Lack of this vitamin is rare.
B6 pyridoxine	Metabolism of proteins.	Whole grain products, meat, fish, nuts, yeast, wheat germ.	2mg*	Rare, some loss in cooking.

* About 10% of the body's

vitamin	Part of enzyme of some reactions	Source, storage, excretion	Deficiency	Effect of deficiency
vitamin H	in several metabolic reactions.			rare.
Folic Acid	Formation of blood cells.	Fruits, cereals, meat, fish, liver, milk.	300mcg	Loss in cooking, extra requirements during pregnancy.
Niacin	Essential for liberation of energy from foods.	Meat, cereals, wheat, bran, peanuts, yeast, liver.	18mg	Loss in food preparation, not fully available in cereals.
C ascorbic acid	Maintains cementing substance between cells, growth, healing of wounds.	Fruits and vegetables, especially blackcurrants.	30mg	Washed out into cooking water, oxidises when food kept hot.
D cholecalciferol	Need for absorption of calcium from diet into blood stream and for deposition of calcium on bones.	Fish liver oils, fatty fish, margarine (little in butter), eggs; formed in skin by exposure to sunshine.	2.5mcg	Lack of sunshine; problem in housebound elderly and growing children.
E tocopherol	Antioxidant – protects fatty tissues and cell walls.	Vegetable oils, wheat germ, wholemeal bread, eggs, nuts.	10mg*	No obvious problems; extra needed when diet rich in polyunsaturates.

*United States figure; no figure quoted in UK Tables.

Source: Food Labelling Regulations 1984

Adequate amounts of these vitamins are present in a well-balanced diet. Deficiency occurs if the diet is poor or if the selection of foods is unsatisfactory. If any aspect of your health or your child's health worries you, consult your doctor.

Vitamin supplements from a reputable manufacturer take into account recommended levels for your daily vitamin requirements.

WHICH EXERCISE IS BEST FOR YOU?

Vitamin supplements have an important role to play in keeping you fit and healthy. Keeping fit also means taking a variety of regular exercise.

Out of breath? You need stamina.

Can't lift or carry? You need strength.

Can't bend or stretch? You need suppleness.

You need all 3 – a combination is best. Choose from . . .

EVERYDAY ACTIVITIES

	STAMINA	SUPPLENESS	STRENGTH
Climbing stairs	★★	★	★★
Digging garden	★	★	★★★
Housework	★	★★	★
Mowing lawn	★	★	★★

★ Little if any effect ★★ Moderate effect ★★★ Very good effect

SPORT AND EXERCISE

	STAMINA	SUPPLENESS	STRENGTH
Aerobic dance‡	***	***	**
Badminton	**	**	**
Cricket	*	**	*
Cycling (hard)	***	*	**
Dancing: Ballroom	*	**	*
Dancing: Disco	**	**	*
Football	**	**	**
Golf	*	**	*
Hill walking	**	*	**
Jogging	***	*	*
Keep fit classes‡	***	***	**
Rowing	***	*	***
Sailing	*	**	*
Skiing: Cross country	***	**	***
Skiing: Downhill	**	**	**
Squash	**	***	**
Swimming (hard)	***	***	***
Tennis	**	**	**
Walking (briskly)	**	*	*
Weightlifting	*	*	***
Yoga	*	***	*

‡ Only if a well-balanced programme has been developed.

* Little if any effect ** Moderate effect *** Very good effect

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